UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 4886

CR NO. 19

OVER THE

CLEARWATER RIVER

DISTRICT 2 - CLEARWATER COUNTY

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 5221 (CEI 38)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 4886, East and West Abutments, were found to generally be in good condition with no defects of structural significance. The channel bottom around the substructure units appeared stable with no evidence of significant scour.

INSPECTION FINDINGS:

(A) Overall, above and below waterline, the concrete of the abutments was typically smooth and sound with areas of hairline map cracking on the wingwalls and on the abutment faces.

(B) Loss of section at joint between southeast wingwall and East Abutment was located 4.8 feet below top of wingwall, 1 foot in diameter with a maximum penetration of 1.5 inches.

(C) Spalling was observed at East Abutment below northernmost beam seat, 8 inches in diameter with a maximum penetration of 1 inch.

(D) The south end of southwest wingwall exhibited delaminated areas 1 foot wide, 3 feet high and 6 inches deep.

(E) Random vertical cracks extending from bridge seat down 4 feet hairline to 1/16 inches wide at approximately every 5 feet along both abutments faces.

(F) Top of footing exposure was observed along the East Abutment from the north end to midpoint with no vertical exposure.

RECOMMENDATIONS:

(A) Monitor footing exposure at East Abutment during future inspections.

(B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 4886

Feature Crossed: Clearwater River

Feature Carried: CR No. 19

Location: District 2 - Clearwater County

Bridge Description: The bridge superstructure consists of a single span of multiple steel girders (I-Beams) supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments.

2. INSPECTION DATA

Professional Engineer/Team Leader: Bradley A. Syler, P.E., S.E.

Dive Team: John J. Loftus, Valerie Roustan

Date: August 17, 2007

Weather Conditions: Sunny, 69°F

Underwater Visibility: 3.0 Feet

Waterway Velocity: None/Negligible

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: East and West Abutments.

General Shape: Solid wall reinforced concrete abutment and with skewed wingwalls.

Maximum Water Depth at Substructure Inspected: Approximately 3.6 feet.

4. WATERLINE DATUM

Water Level Reference: The top of bearing seat at the south end of West Abutment.

Water Surface: The waterline was approximately 3.3 feet below reference.
Waterline Elevation = 96.7.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 6

Item 61: Channel and Channel Protection: Code 7

Item 92B: Underwater Inspection: Code B/08/07

Item 113: Scour Critical Bridges: Code G/07

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

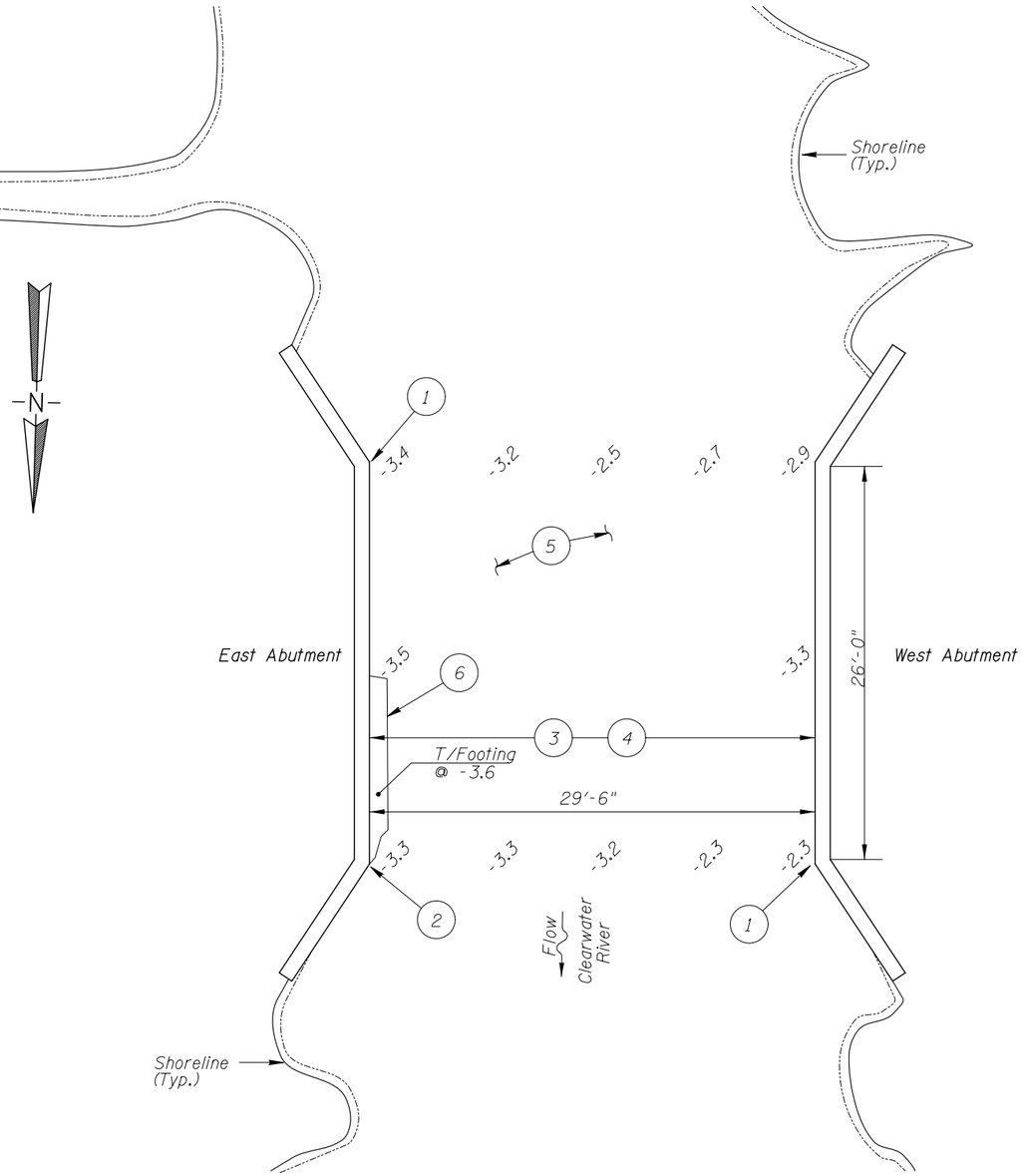
_____Yes X No

Photograph 1. Overall View of Bridge, Looking Southeast.

Photograph 2. View of East Abutment, Looking Southeast.

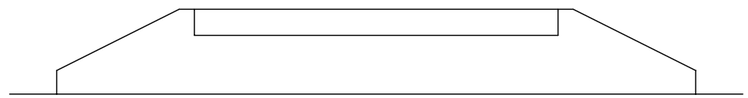
Photograph 3. View of West Abutment, Looking Southwest.

Photograph 4. View of Deteriorate Concrete at South end of Southwest Wingwall.



INSPECTION NOTES:

1. *Loss of section at the joint between the southeast wingwall and East Abutment. It is 4.8 feet below the top of the wing wall measuring 1 foot in diameter with a maximum penetration of 1.5 inches with no exposed rebar.*
2. *Spall was observed at East Abutment below northernmost beam seat measuring 8 inches in diameter, with a maximum penetration of 1 inch with no exposed rebar.*
3. *Random vertical cracks extending from the bridge seat down 4 feet measuring from hairline to 1/16 inches wide located approximately every 5 feet along both abutment faces.*
4. *Above and below the waterline the concrete was typically smooth and sound with areas of hairline map cracking on the wingwalls and on the abutment faces for the first 3 feet from the wingwalls.*
5. *The channel bottom consisted of silty sand with 1 foot of probe rod penetration.*
6. *Footing exposure was observed along the East Abutment from north end to midpoint with no vertical exposure.*
7. *The end of Southwest wingwall was delaminated. The area measured 1 foot wide, 3 feet high, with 6 inches of penetration, with no exposed rebar.*



TYPICAL ELEVATION VIEW OF EACH ABUTMENT

GENERAL NOTES:

1. *The East and West Abutments were inspected underwater.*
2. *At the time of inspection, on August 17, 2007, the waterline was located approximately 3.3 feet below the top of the bearing seat at the south end of the West Abutment. Due to lack of design plan information, the reference elevation was assumed to be 100.0 feet. This corresponds to waterline elevation of 96.7 feet.*
3. *Soundings indicate the water depth at the time of inspection and are measured in feet.*
4. *Soundings were taken parallel to north and south fascias at 1/4 point intervals.*

Legend

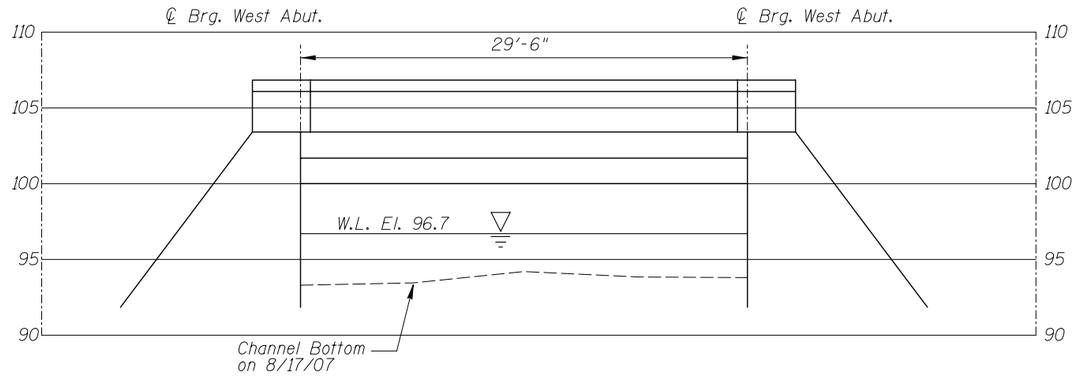
-0.4 Sounding Depth (8/18/07)

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

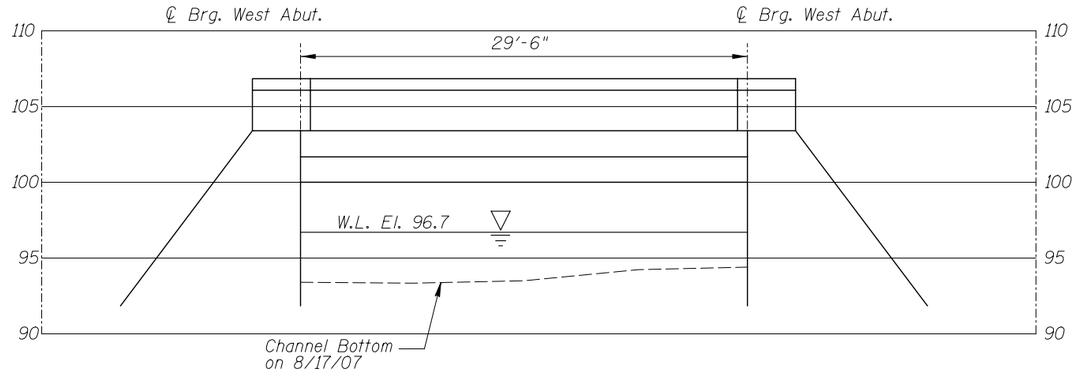
STRUCTURE NO. 4886
OVER THE HEIR CREEK
DISTRICT 2, CLEARWATER COUNTY, CITY OF BAGELY

INSPECTION AND SOUNDING PLAN

Drawn By: CAI	COLLINS ENGINEERS, INC. 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: AUGUST, 2007
Checked By: MDK		Scale: NTS
Code: 52210038		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

STRUCTURE NO. 4886
OVER THE HEIR CREEK
DISTRICT 2, CLEARWATER COUNTY, CITY OF BAGELY

UPSTREAM AND DOWNSTREAM
FASCIA PROFILES

Drawn By: CAI	COLLINS ENGINEERS 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: AUGUST 2007
Checked By: MDK		Scale: 1"=10'
Code: 52210038		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: August 17, 2007
ON-SITE TEAM LEADER: Bradley A. Syler, P.E., S.E
BRIDGE NO: 4886 WEATHER: Sunny, 69°F
WATERWAY CROSSED: Clearwater River
DIVING OPERATION: X SCUBA _____ SURFACE SUPPLIED AIR
_____ OTHER
PERSONNEL: John J. Loftus, Valerie Roustan
EQUIPMENT: Scuba, Probe Rod, Lead Line, Sounding Pole, U/W Light, Scraper, Camera
TIME IN WATER: 11:00 a.m.
TIME OUT OF WATER: 11:30 a.m.
WATERWAY DATA: VELOCITY None/Negligible.
VISIBILITY 3.0 Feet
DEPTH 3.6 Feet maximum at East Abutment
ELEMENTS INSPECTED: East and West Abutments
REMARKS: Overall, above and below waterline, concrete was typically smooth and sound with areas of hairline map cracking on the wingwalls and on the abutment faces. Spalling was observed at East Abutment below northernmost I-beam seat, 8 inches in diameter with a maximum penetration of 1 inch. Loss of section at joint between southeast wingwall and East Abutment was located 4.8 feet below top of wingwall, with 1 foot in diameter with a maximum penetration of 1.5 inches. The south end of southwest wingwall was delaminated (1 foot wide, 3 feet high and 6 inches deep). No exposed reinforcement was observed. Random vertical cracks extending from bridge seat down 4 feet, hairline to 1/16 inches wide, were present at approximately every 5 feet along both abutments faces. Footing exposure was observed along the East Abutment from the north end to midpoint with no vertical exposure.

FURTHER ACTION NEEDED: _____ YES X NO

Monitor the footing exposure at East Abutment during future inspections.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 4886
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Bradley A. Syler, P.E., S.E.
WATERWAY CROSSED Clearwater River

INSPECTION DATE August 17, 2007

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.		MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER (BRACING)	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
	UNIT DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	East Abutment	3.6’	N	6	7	9	N	6	8	8	N	N	8	6	N	N	N	N	N
	West Abutment	3.3’	N	6	N	9	N	6	7	8	N	N	7	6	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, above and below waterline, concrete was typically smooth and sound with areas of hairline map cracking on the wingwalls and on the abutment faces. Spalling was observed at East Abutment below northernmost I-beam seat, 8 inches in diameter with a maximum penetration of 1 inch. Loss of section at joint between southeast wingwall and East Abutment was located 4.8 feet below top of wingwall, with 1 foot in diameter with a maximum penetration of 1.5 inches. The south end of southwest wingwall was delaminated (1 foot wide, 3 feet high and 6 inches deep). No exposed reinforcement was observed. Random vertical cracks extending from bridge seat down 4 feet, hairline to 1/16 inches wide, were present at approximately every 5 feet along both abutments faces. Footing exposure was observed along the East Abutment from the north end to midpoint with no vertical exposure.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.